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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/622,484	01/02/2001	Kazuo Sugai	500 38900X00	6568

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EXAMINER	
KIANERSI, MITRA	
ART UNIT	**PAPER NUMBER**
2143	8

DATE MAILED: 07/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/622,484	SUGAI ET AL.	
	Examiner	Art Unit	
	Mitra Kianersi	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 January 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Specification

1. On page 7 line 4 of specification, the term "NSI" appears incorrect. It appears the correct term is "NS1". Correction is required.

Drawings

2. New corrected drawings are required in this application because in Fig. 5, it appears sub-network address 100/1 should be N1001.

Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Chao et al. U.S. Patent 6,389,031 issued 05/14/2002.

3. As to claim 1, Chao et al. teach a network-forwarding device (Col.1, line 8) connecting a plurality of networks comprising:

A port to which one of said networks is connected (Col. 3, lines 9-12),

A network interface (Col. 3, line 3, section iv) connected to port and controlling an interface with the network connected to said port; and a routing processor connected to said network interface via an Intra-device communication line and performing routing of a packet received from network interface (Col. 3, lines 13-15), wherein routing processor includes: path information holding means; and next-path searching means for calculating, based on path information held in said path information holding means, a path to which the received packet is to be forwarded next and wherein, in a 2-branch tree search in which a destination address of the received packet is checked (Col.4, lines 23-34), one bit at a time beginning at a highest-order bit, said next-path searching means combines p (p is an integer equal to or larger than 2) levels into one 2^P branch tree to perform a search of the p levels of the 2-branch tree as a one-level search. See (FIG.15) and corresponding text at (Col. 20 lines 56-66). In FIG. 15 Chao et al. illustrate a logical structure of the hierarchical searching.

4. Referring to claim 2, Chao et al. disclose the network forwarding device where according to claim 1 next-path searching means combines a total of (2^P-1) 2-branch tree nodes, composed of one 2-branch tree node and immediately lower 2-branch tree nodes of (p-1) levels, into one said 2^P-tree node and, into the combined lowest-level $2^{(P-1)}$-branch tree nodes, embeds path data allocated to higher-level nodes to form said 2^P-tree node with $2^{(P-1)}$ 2-branch tree nodes. See Col. 39 section ii-F, and Col. 40, section I-C.

5. As to claim 3, Chao et al. teach the network-forwarding device according to Claim 2 wherein, when combining a plurality of 2-branch Trees, said next-path-

searching means has only one element if the element may be shared. See (Col. 7, lines 17-20).

6. As to claim 4, Chao et al. teach the network-forwarding device according to claim 2 next-path searching means does not read a whole node when reading the 2^P-branch tree node but reads only data corresponding to one of the $2^{(P-1)}$ 2- branch tree nodes combined when the 2^P-tree node was created. See (FIG.21) and (Col.23, lines 26-31).

7. As to claim 5, Chao et al. discloses the network-forwarding device according to claim 2 where next-path searching stores into each node refer to (Col. 39, section F), and (Col. 40, section C) not a mask length of the node, [Examiner's note: Masking is performed by using a logical operator (AND, OR, XOR, or NOT) to combine the mask and the data value. See Microsoft Computer Dictionary 5^{th} edition pp.329], but a mask length of a node immediately below the node, to find the node mask length before reading data of the node and selects a part of the node data to be read according to a value stored in a bit position, indicated by the node mask length, to the bit position +p-1. See (FIG. 30) and (Col. 33, lines 19-47).

8. As to claim 6, Chao et al. teach the network forwarding device according to claim 4 where next-path searching device provides a flag in data that is read first for each node, said flag indicating whether or not a path is allocated to the node, reads the flag first, and does not read path information for a node to which the path is not allocated. See FIG. 3A illustrating the flag field 312 used to control fragmentation.

9. As to claim 7, Chao et al. teach the network-forwarding device according to claim 1 wherein said network forwarding device is a router. See (Col. 1. line 8).

10. As to claim 8, Chao et al. teach a network-forwarding device (Col.1, line 8) connecting a plurality of networks comprising:

A port to which one of said networks is connected; (Col. 3, lines 9-12);

A network interface (Col. 3, line 3, section iv) connected to said port and controlling an interface with the network connected to said port; and a routing processor connected to said network interface via an intra-device communication line and performing routing of a packet received from said network interface; wherein routing processor includes: path information holding means; and next-path searching means for calculating, based on path information held in said path information holding means, a path to which the received packet is to be forwarded next wherein said next-path searching means searches for a next path using a 2-branch tree search in which a destination address is checked, one bit at a time, beginning with a highest-order bit, performs a search for a match of an address and a mask by associating a bit position to be checked with a mask length, expands 2^m m-bit (m is a natural number) mask nodes into fixed positions in storing means, makes each of the m-bit mask nodes correspond, one to one, with a value that may be represented by bit 0 to bit (m-1) of the destination address, and selects one of the m-bit mask nodes according to a value represented by bit 0 to bit (m-1) of the destination address. (Col. 25, lines 17-31) and (Col 16, lines 52-67).

11. As to claim 9, Chao et al. teach a network-forwarding device (col. 1, line 8) connecting a plurality of networks comprising:

A port to which one of said networks is connected, a network interface connected (col. 3, lines 9-12) to said port and controlling an interface with the network connected to

said port; and a routing processor connected to said network interface via an intra-device communication line and performing routing of a packet received from said network interface; wherein said routing processor includes: path information holding means; and next-path searching means for calculating, based on path information held in path information holding means, a path to which the received packet is to be forwarded next wherein next-path searching means searches for a next path using a 2-branch tree search in which a destination address is checked, one bit at a time, beginning with a highest-order bit, stores 0- to k-bit mask 2-branch tree nodes in internal storing means of next-path searching means, a number of bits of each of said nodes being equal to or smaller than a predetermined number, stores (k+l) bit or longer mask 2-branch tree nodes in external storing means of said search means, and performs pipeline processing for 0- to k-bit mask node search processing and (k+l) bit or longer mask node search processing (Col 38, lines 54-63).

12. As to claim 10, Chao et al teach a network next-hop search method for use in a network-forwarding device (col. 1,line 8) connected to a plurality of network and transmitting a packet received from one of said networks to a next hop. Chao et al. Illustrate in Figs. 9 and 3A, how the classifier and route selection means 910 determines the next hop address for a packet, based on the packet's class and destination address (recall field 324). A class corresponds to flow(s) having the same QoS requirements. See (Col 11, lines 17-24) and also (Col 9, lines 52-60). Based on path information wherein, in a 2-branch tree search in which a destination address of the received packet is checked, one bit at a time beginning at a highest-order bit, p (p is

an integer equal to or larger than 2) levels are combined into one 2^p-branch tree to perform a search of the p levels of the 2-branch tree as a one-level search. See FIG.15 and corresponding text at (Col. 20 lines 56-66). In FIG. 15 Chao et al. illustrate a logical structure of the hierarchical searching.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to mitra kianersi whose telephone number is (703) 305-4650. The examiner can normally be reached on 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (703) 308-5221. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-9923 for regular communications and (703) 746-9923 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Mitra Kianersi
July 8, 2003

DAVID WILEY
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